AMENDMENTS TO THE CLAIMS

1. (Currently Amended) A diamond n-type semiconductor comprising a first diamond semiconductor which has n-type conduction and in which a distortion ~~or defect~~ is artificially formed,

wherein said first diamond semiconductor has an n-type dopant concentration adjusted by vapor-phase growth such that an electron concentration of said first diamond semiconductor exhibits a negative correlation with temperature, in a temperature range having a width of 100°C or more and included within a temperature region from 0°C to 300°C.

2. (Previously Presented) A diamond n-type semiconductor according to claim 1, wherein said first diamond semiconductor has a Hall coefficient exhibiting a positive correlation with temperature, in the temperature range.

3. (Previously Presented) A diamond n-type semiconductor according to claim 1, wherein the temperature range, included within the temperature region from 0°C to 300°C, has a width of over 200°C or more.

4. (Previously Presented) A diamond n-type semiconductor according to claim 1, wherein said first diamond semiconductor has a resistivity of 500 Ωcm or less at a temperature within the temperature region from 0°C to 300°C.

5. (Previously Presented) A diamond n-type semiconductor according to claim 1, wherein the electron concentration of said first diamond semiconductor is always 10^{16} cm^{-3} or more in the temperature region from 0°C to 300°C.

6. (Previously Presented) A diamond n-type semiconductor according to claim 1, wherein said first diamond semiconductor contains more than 5×10^{19} cm^{-3} in total of at least one kind of donor element.

7. (Original) A diamond n-type semiconductor according to claim 6, wherein said first diamond semiconductor contains at least P (phosphorus) as the donor element.

8. (Original) A diamond n-type semiconductor according to claim 6, wherein said first diamond semiconductor contains at least S (sulfur) as the donor element.

9. (Previously Presented) A diamond n-type semiconductor according to claim 1, wherein said first diamond semiconductor contains an impurity element other than a donor element together with the donor element.

10. (Previously Presented) A diamond n-type semiconductor according to claim 9, wherein said first diamond semiconductor contains Si of 1×10^{17} cm^{-3} or more as the impurity element.

11. (Previously Presented) A diamond n-type semiconductor according to claim 1, wherein said first diamond semiconductor is monocrystal diamond.

12. (Previously Presented) A diamond n-type semiconductor according to claim 1, further comprising a second diamond semiconductor provided adjacent to said first diamond semiconductor and turned out to be n-type,

wherein said second diamond semiconductor has an electron concentration not exhibiting a negative correlation with temperature and a Hall coefficient not exhibiting a positive correlation with temperature, in the temperature range.

13. (Previously Presented) A semiconductor device at least partly employing a diamond n-type semiconductor according to claim 1.

14. (Previously Presented) An electron emitting device having the diamond n-type semiconductor according to claim 1 employed in at least an electron emitting part thereof.

15. (Currently Amended) A method of manufacturing a diamond n-type semiconductor, said method comprising the steps of:

preparing a diamond substrate; and

epitaxially growing a diamond semiconductor on said diamond substrate by vapor phase growth while artificially introducing an impurity element other than a donor element to said diamond substrate, whereby said diamond semiconductor has n-type conduction and has a distortion ~~or defect~~ which is artificially formed therein,

wherein said diamond semiconductor has an n-type dopant concentration adjusted by said vapor-phase growth such that an electron concentration of said diamond semiconductor exhibits a negative correlation with temperature, in a temperature range having a width of 100°C or more and which included within a temperature region from 0°C to 300°C.

16. (Original) A method of manufacturing a diamond n-type semiconductor according to claim 15, wherein Si is artificially introduced as the impurity element to said diamond substrate.